Swan River Catchment: Status of the Swan Galaxias (*Galaxias fontanus*).

Report to the Tasmanian Irrigation Development Board

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Introduction

An assessment of the status of the Swan Galaxias (*Galaxias fontanus*) in the catchment was requested by the Tasmanian Irrigation Development Board (IDB) prior to proceeding with investigations of the potential of water irrigation infrastructure development within the Swan River catchment.

The Swan Galaxias is a species of freshwater fish, native to Tasmania and endemic to the upper Swan River and Macquarie River catchments. The species is listed as Endangered under both the Tasmanian Threatened Species Protection Act (TSPA 1995) and the Commonwealth Environment Protection and Biodiversity Conservation Act (EPBC 2005).

First discovered in the upper Swan River in the late 1970's, in the mainstem and tributaries upstream of Hardings Falls (see Figure 1). After subsequent surveys, further populations were then discovered in several small streams in the upper (eastern) Macquarie catchment. All known populations are small and highly vulnerable to predation by trout and to drying. Following commencement of a formal program to manage the species, funded under the Commonwealth Threatened Species Recovery Program, the species' status was established, and recovery actions initiated. Among these were the protection of existing populations through on-site management and works, and the establishment of new translocated populations in suitable and more secure locations.

Locations were sought to establish new populations within the Swan River catchment by the translocation of small numbers of fish from the original upper Swan River site. Sites were sought upstream of large barriers to trout movement (e.g. waterfalls) and with no fish present. Two populations were successfully established, one each in Lost Falls Creek and the Cygnet River.

GIS data for the Swan catchment to date indicates the presence of *G. fontanus* populations in the Swan River and tributaries upstream of Hardings Falls, in Lost Falls Creek upstream of Lost Falls, an in the upper Cygnet River upstream of Meetus Falls.

Sites have been surveyed for fish within the Swan catchment since the late 1980's for a variety of purposes. These include searches for other *G. fontanus* populations, surveys to identify locations suitable for *G. fontanus* translocation, surveys for environmental flow and eel stock assessment, and miscellaneous surveys by IFS and university personnel for research purposes. For this project we complied details and results of these surveys in a form which can be used to confirm the distribution of fish species within the catchment.

From 1978 to 2002, all known populations were restricted to streams of the upper Swan and eastern margins of the Macquarie catchment. Four new populations were subsequently discovered along the

western edge of the Macquarie River catchment, between Floods Rivulet in the south and the catchment of Brumbys Creek in the north.

At the same time, native fish distribution modelling was being conducted for the project developing the CFEV (Conservation of Freshwater Ecosystem Values) framework (DPIW 2008). Modelling of barriers to fish movement revealed that the middle section of Cataract Gorge, now mostly drowned by the hydroelectric storage of Lake Trevallyn, formed a significant natural barrier to fish movement.

These two new observations have led to a revision of the probable distributional history of *G. fontanus*. It is now thought highly likely that the species was widely distributed throughout the Macquarie-South Esk and upper Swan catchments until the arrival of brown trout and redfin perch, two alien fish species introduced in the late 1800's and known to eliminate *G. fontanus* populations through predation. The current distribution is therefore believed to be that of relict populations in small tributary streams upstream of barriers to trout and/or redfin perch movement. These streams must maintain a base flow during dry periods sufficient to sustain refugial pool habitats. Thus, populations are likely to be small and restricted to short stream reaches between the upper extent of sustained base flow and a barrier to upstream movement of trout and/or redfin perch. The barriers can be substantial waterfall/chute features, reaches with sustained steep slopes or braided shallow wetland features with dispersed drainage and indistinct channel formation.

In this study, these principles were applied to Swan River catchment GIS data in order to formally identify river reaches likely to be suitable to sustain *G. fontanus* populations. These were selected as one set of new priority reaches for survey.

Three potential irrigation supply dam sites have been identified in the Swan catchment, each located on the mainstem of the Swan River. One, upstream of Hardings Falls, falls within the current known distribution of *G. fontanus*, and therefore is not actively being considered for development. A second has been identified downstream of Hardings Falls, and a third at Waters Meeting, in the middle reaches of the Swan River. Stream reaches immediately within, and adjacent to, the 'footprint' of these proposed storages (when full) have therefore also been selected as a second set of priority reaches for survey in this study.

This report documents the results of all surveys conducted to date as well as for new sites surveyed in March 2009, and comments on the status of the Swan galaxias in the Swan Rive catchment.